UNITED STATES DISTRICT COURT

DISTRICT OF MINNESOTA

IN RE BANC OF CALIFORNIA SECURITIES LITIGATION	Court File No. 0:18-mc-00076-WMW-KMM

DECLARATION OF TORBEN VOETMANN, PH.D.

September 28, 2018

I. INTRODUCTION

I, Torben Voetmann, have been asked by Latham & Watkins, counsel for Mr. Steven Sugarman in the matter *In re Banc of California Securities Litigation*, No. SACV 17-00118 AG (DFMx) consolidated with SACV 17-00138 AG (DFMx) (C.D. Cal.), to explain the nature of FINRA transaction data and Bloomberg data. I have also been asked to explain how such data was processed in order to produce relevant analysis in this matter.

I am a Principal at The Brattle Group, a financial and economic consulting firm, and an adjunct professor at the University of San Francisco's School of Management. I received a Bachelor of Science degree in Business Administration from Aarhus School of Business in 1991, a Master's degree in Finance from the Aarhus School of Business in 1993, and my doctorate in Finance from Copenhagen Business School in 2000. A copy of my curriculum vitae is attached hereto as Appendix A.

II. FINRA DATA AND BLOOMBERG DATA

A. BLOOMBERG DATA

Bloomberg L.P. provides access to both real-time and historical financial market data, including a given stock's put (call) option trading volume defined as the volume of all put (call) options traded on a certain trading day. Bloomberg also calculates the put-call trading volume ratio, which is the ratio of total put trading volume to total call trading volume. These variables measure the trading activity in put options relative to that in call options. Movements for this ratio demonstrate changing trader expectations that a stock price is likely to fall. The spike in trading volume for put options and the increased put-call trading volume ratio just prior to the Blog post show that in this timeframe traders in the market gained an expectation that the stock price would fall.

B. FINRA OPTION DATA

The FINRA Option data contains two datasets: (1) details of individual option transactions and (2) end-of-day option positions. The transaction-level dataset does not contain any trader-specific identifiers. The end-of-day option positions dataset does contain the names of the traders and their end-of-day positions for each type of call and put options (differentiated by strike prices and time to maturity). The end-of-day dataset was used to identify an increasing concentration of short positions in Banc stock held by a small number of entities prior to the Blog post, and a reversed position by entities immediately afterwards.

Note that the FINRA data (both FINRA OATs and FINRA option) include only those trades reported by FINRA members to the NYSE and NASDAQ Trade Reporting Facility. As such, the FINRA data only provides a baseline inference of the trading behavior by potential short sellers and put option holders. Another limitation of the FINRA Option transaction data is the lack of an identifier of the trading entity. It therefore cannot be used to match actual

transactions with the changing end-of-day option positions, in order to evaluate whether the daily position changes reported of specific entities such as Castalian Partners and Mr. Gibson were associated with certain well-timed transactions that may be under scrutiny.

C. FINRA OATS

FINRA OATS data can be used in analyses of short sellers' trading behavior. This data contains five datasets, namely: EXCTN_MTCH, NEW_ORDERS, PROCESS_ORDERS, OLA_LINK, and RNTG_MTCH. These five datasets do not contain the same data fields. Short sellers' trading activity can be identified using EXCTN_MTCH ("Execution Match"). This dataset contains details of individual transactions reported by FINRA members, such as the date and timestamp of the trade, the transacted quantity and price, the type of trade (buy, sell long, short sale, and short exempt), and the Nastrac customer ID. The Customer ID is associated with the name of the trade execution broker-dealer. One important limitation of the FINRA transaction data is that it does not include an identification of the trader. None of the data fields provided allows for the identification of the individual entities engaging in short selling activities.

The FINRA data, including the Execution Match dataset, was processed in two steps: (1) convert the data file into a Windows readable format (since the raw FINRA data is exported from a UNIX system in the form of GZ files, which cannot be read by Windows) and (2) clean the data inside the data file. The first step allowed the GZ files to be converted to TXT files. The second step further refined the data in the TXT files by converting UNIX characters to their Windows-equivalent characters. Note that the FINRA data do not contain headers indicating the specific data fields. Therefore, the processed data from the second step was merged with headers found in the "EXCTN_MTCH" tab of the Excel file titled "Header File for all five OATS data types O.xlsx." Finally, the data was exported into a CSV file, which allowed economic analysis

of the trading behavior by short sellers to be performed using statistical software packages. This processed data allowed us to connect the trades executed by Customer ID 817 to the executing firm for the trades associated with Customer ID 817 (i.e., ACS Execution Services). In response to a subpoena, ACS Services then identified the broker-dealer for these trades, and the broker-dealer identified the trader as a known short seller called Muddy Waters. The underlying traders for other Customer IDs remain unidentified.

III. IDENTIFYING SHORT SELLERS AND PUT OPTION HOLDERS

The FINRA data and Bloomberg data described above was used to identify and analyze trading behavior of market participants who shared the belief of a potential decline in Banc's stock price. Using the Execution Match dataset from FINRA, the timing of trades of short-sellers in Banc stock were also analyzed. As a result of this analysis we developed the charts and figures regarding trading behavior that appear in Mr. Sugarman's Memorandum In Support Of His Motion to Compel Production.

In the four calendar days between October 14, 2016 and October 17, 2016—that is, just shortly before the release of a blog post by an anonymous writer with the penname Aurelius on the Seeking Alpha website (the Blog post)—the FINRA Option Data shows a large increase in short sale volume. REDACTED

Such a position would (and did) allow these entities to make a profit if Banc stock price subsequently declined.

A comparison of FINRA Option Data and end-of-day dataset demonstrates that after the Blog was posted, these short sellers immediately covered their short sales (i.e., the transaction

data shows that these short sellers purchased shares at quantity sufficient to cover their short positions indicated in the end-of-day dataset), thus capitalizing immediately on the stock price drop. Moreover, REDACTED

These demonstrate that this short seller benefited from not only the temporary stock price decline, but also from the subsequent stock price rebound. Having access to the trading records of Castalian Partners and Mr. Gibson would make it possible to observe whether they also engaged in a similar trading strategy.

This well-timed behavior in the equity market was mirrored in the option market. First, the trading volume of put options in Banc stock (as reported by Bloomberg) spiked in the days prior to the Blog post. In early October, the trading volume in put options in Banc stock was moderate at one or two hundred (put options) per day. During the week immediately prior to the posting of the Blog on October 18, 2016, the volume of put options trades increased to nearly 2,000 per day. On October 17, 2016, the day before the Blog post, the put-call trading volume ratio in Banc stock spiked, with trading volume in put options reaching 300 times the volume of call options (compared to less than 10 in early October).

The FINRA end-of-day option positions data show that certain put option traders exhibited similarly well-timed behavior as that of short-sellers in Banc stock. Comparison of FINRA Option Data and FINRA OATS data further reveals that REDACTED

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As mentioned, because the FINRA transaction data does not include an identifier of the individual trader, it is impossible to determine from the FINRA data on its own whether the known daily position changes reported REDACTED were due to their ownership of these particular, well-timed transactions.

IV. ACADEMIC LITERATURE SUPPORTS THE RESULTS PRODUCED BY THE FINRA AND BLOOMBERG DATA

The above trading pattern identifiable by the FINRA and Bloomberg data—opening a large short position shortly before the issuance of a negative report, and then immediately exiting the short position and benefiting from a stock price decrease resulting from the report—mimics a pattern that the recent academic literature refers to as a "short and distort" trading strategy.

A short-and-distort trading strategy consists of four steps. First, some traders build a short position in the stock, e.g., Customer ID 817, Castalian Partners and Mr. Gibson in the case of Banc stock prior to October 18, 2016. Second, the same traders publicly disclose their short thesis (in the form of a detailed report on a free-access, widely-used online platform), similar to the Blog post by Aurelius. Third, the short thesis disclosure results in negative market sentiment, triggering selling by other investors and a subsequent price decline—as what happened to Banc stock immediately after the posting of Aurelius' Blog. This is when the traders exit their short position and make a profit, as Muddy Waters, Castalian Partners and Mr. Gibson did. Last, the market eventually realizes that "the pseudonymous [writing under a fictitious identity] author is

spreading baseless rumors."[1] The price subsequently adjusts, resulting in a stock price reversal—by the time the market closed on October 19, 2018, Banc's stock had recovered 45 percent of the previous day's decline.[2]

Note that the last step above is an *observed* outcome. The traders with the short thesis might or might not have a genuine belief that their signal is accurate, with both scenarios having been examined and discussed in the recent literature. The literature examines the abnormal activity in the short-sale market as well as the option market using variables similar in nature to that derived from the FINRA and Bloomberg data described above.[3]

V. CONCLUSION

For the reasons set forth above, due to the limitation of the FINRA Oats and FINRA transaction data, having access to the transaction data of Castalian Partners and Mr. Gibson, along with their communications and analysis regarding those transactions, would help the court analyze and understand how their specific trading behavior might have impacted the stock price of Banc.

September 28, 2018

Torben Voetmann

[1] Mitts, J., 2018, "Short and distort," *Working Paper*, p. 2.
[2] *See e.g.,* Putnins, T.J., 2012, "Market manipulation: A survey," *Journal of Economic Surveys, 26* (5), 952 – 967, p. 956. Also see Allen, F., and Gale, D., 1992, "Stock-price manipulation," *The Review of Financial Studies*, *5* (3), 503-529; Jones, C.M., 2012, "Shorting restrictions: Revisiting the 1930s," *The Financial Review*, *47* (1) and Soros, G., "One way to stop bear raids," *The Wall Street Journal,* March 23, 2009.
[3] *See e.g.,* Mitts, J., 2018, "Short and distort," *Working Paper*; Ljungqvist, A., and Qian, W., 2016, "How Constraining Are Limits to Arbitrage?", *The Review of Financial Studies, 29* (8), 1975 – 2028.